(12) UK Patent Application (19) GB (11) 2 330 100 (13) A

(43) Date of A Publication 14.04.1999

(21) Application No 9810717.0

(22) Date of Filing 19.05.1998

(30) Priority Data
(31) BS97A083 (32) 08.10.1997 (33) IT

(51) INT CL[6]
B23K 1/002

(52) UK CL (Edition Q)
B3R RBH R115 R320

(56) Documents Cited
EP 0244947 A US 4224494 A

(58) Field of Search
UK CL (Edition P) B3R
INT CL[6] B23K
Online:WPI

(71) Applicant(s)
Inoxriv Di Rivadossi F. & Figli S.p.A.
(Incorporated in Italy)
Via Bernocchi 48, Cobozzo V T (Brescia), Italy

(72) Inventor(s)
Alessandro Rivadossi

(74) Agent and/or Address for Service
Potts, Kerr & Co
15 Hamilton Square, BIRKENHEAD, Merseyside,
L41 6BR, United Kingdom

(54) Abstract Title
Induction brazing

(57) Means for the brazing of components having different thicknesses and/or areas of contact comprises a first device (5) acting as a support for holding first component (1), the said first device (5) having a top (6) including an induction heating coil (7), and a second device (12) for holding the components in position eg by means of rams 13. Means 14 may be provided to cool some areas of the workpiece.

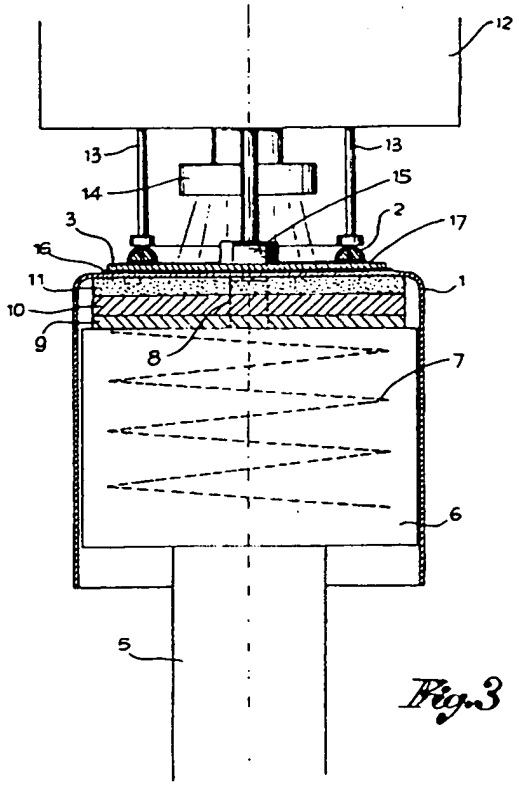

Fig.3

GB 2 330 100 A

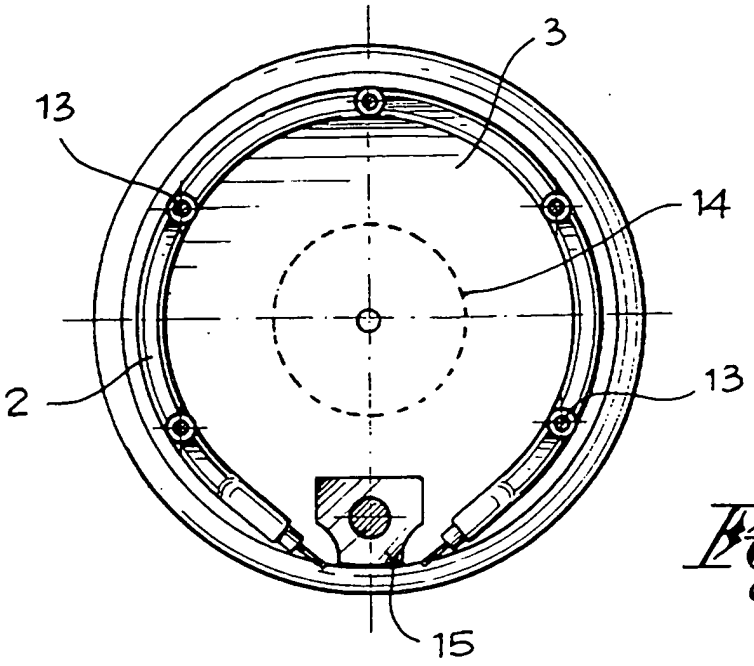

Fig.1

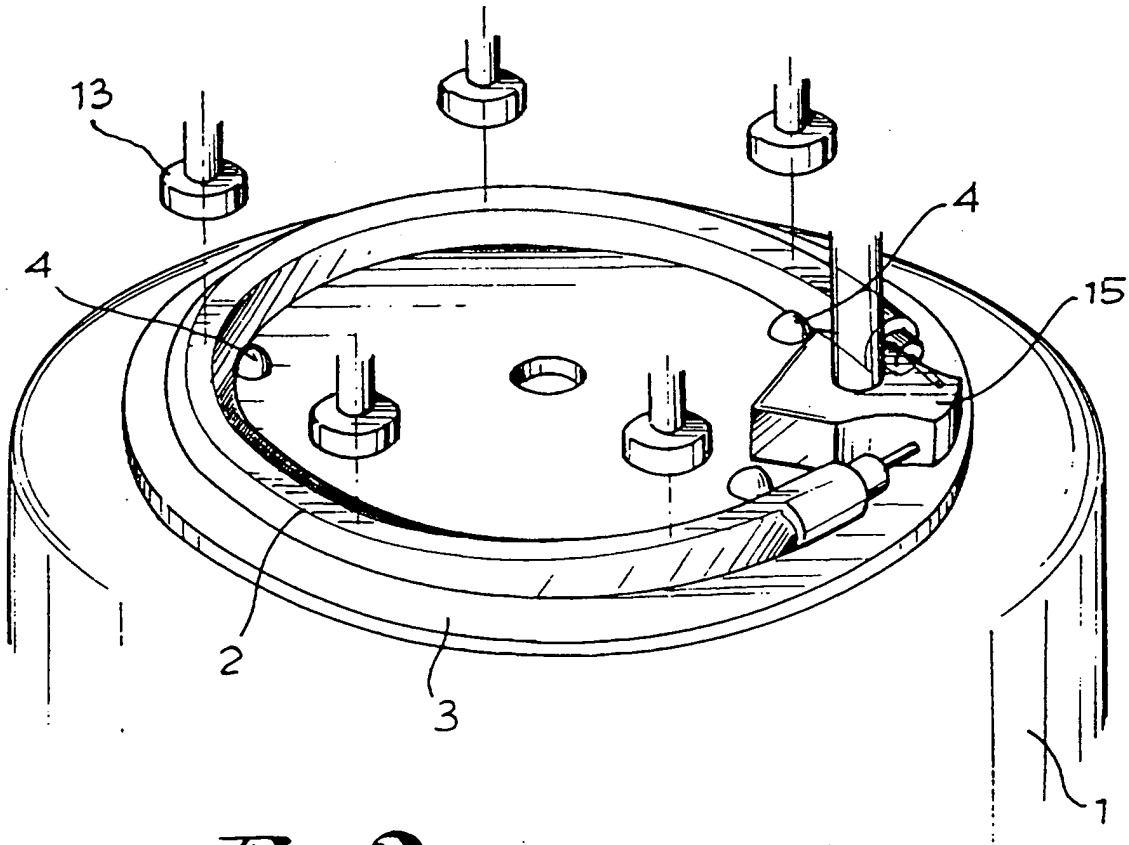

Fig.2

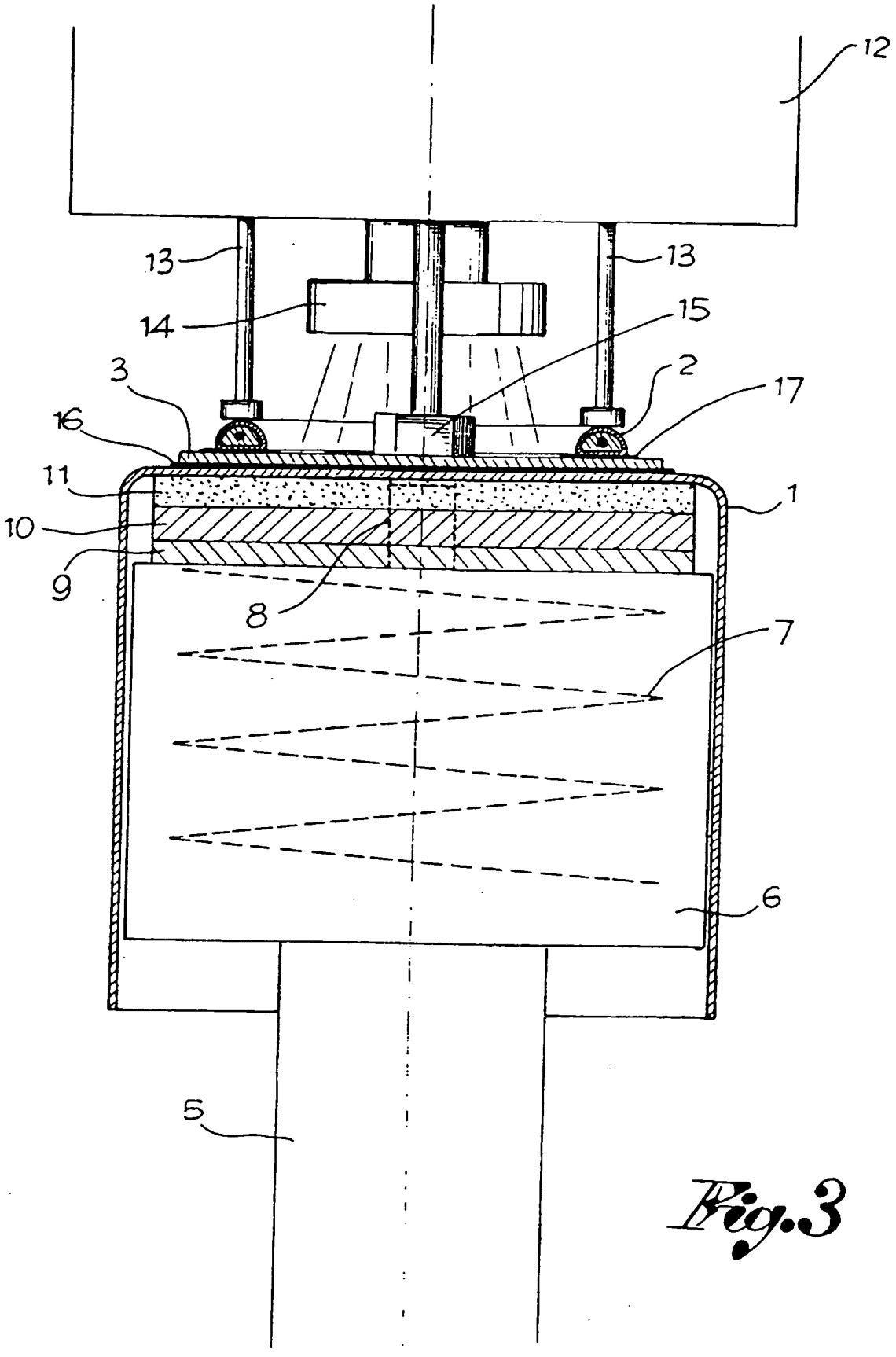

Fig.3

2330100

IMPROVED MEANS FOR THE UNIFORM BRAZING OF COMPONENTS HAVING DIFFERENT THICKNESSES AND/OR AREAS OF CONTACT

The present invention relates to means for the uniform brazing of components which differ from each other, particularly in regard to their thickness and/or their mutual areas of contact.

It is known that brazing can be used to join different parts by placing a suitable material between them and then bringing this material to its melting point so that the parts are brazed together. This known and widely-used application nevertheless encounters certain limitations in some cases where, for example, the different parts which are to be brazed together are not uniform in shape, but in particular in connection with their thickness and the areas which have to be heated during brazing.

The purpose of this invention is to overcome such problems by using suitable means which are shown in the example herein as being applied to the production of electrically heated container ends, but which can nevertheless be adapted to other uses and purposes, such as, for example, the application of plates of irons, the bases of electric deep fryers, etc.

According to the present invention there is provided means for the brazing of components having different thicknesses and/or areas of contact comprising a first device acting as a support for holding a first component, the said first device having a top including an induction heating coil, and a second device for holding the components in position.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:-

Fig. 1 is a plan base of a container provided with an electrical resistance;

Fig. 2 is a perspective view of the base of Fig. 1 with some components of the equipment in question; and

Fig. 3 is a partial schematic cross-section illustrating the brazing means.

In the drawings there is illustrated a body, for example of stainless steel, comprising a container (1) which can be heated by means of a suitable electrical resistance 2. The resistance 2 is appropriately centered with respect to a plate 3, e.g. of aluminium, by means of projections 4.

In Fig. 3, the whole brazing apparatus and workpiece comprising a container to have a plate and heating coil, brazed thereto are illustrated and substantially comprises a device 5 for housing and the supporting container 1 and whose top 6 include an induction heating coil 7.

The top 6 has in its upper part a centering pin 8 designed to retain disks 9, 10 and 11 of mica, steel and graphite respectively.

As may be seen from Fig. 3, container 1 is inverted and placed on top 6 of support 5 so that the base of the container is supported on the graphite disk.

On top of the support 5 another device indicated as a whole by 12 is placed, and device 12 is capable of movement in the vertical plane by appropriate means (not shown). Device 12 has a plurality of rams 13 and an air blower 14 located in a central position with respect to

plate 3 and consequently to resistance 2.

Device 12 also has a spring-loaded ram 15 which is designed to bear against plate 3 (see Fig. 1) in the area between the supply terminals of resistance 2.

By means of a suitable operation, molten or fusable material 16 which is intended for subsequent brazing of plate 3 is applied to the outer part of the base of container 1. Similarly other molten or fusable material 17 is applied to the upper part of said plate 3 in the vicinity of electrical resistance 2.

At the start of the brazing process, the top 6 of support 5 is brought to an appropriate temperature by means of induction heating coil 7, and this temperature is uniformly distributed over the inside of the base of container 1 through the action of disks 9, 10 and 11.

At the same time device 12 is lowered so that rams 13 hold resistance 2 locked in position and ram 15 holds plate 3, the said set of rams at the same time firmly clamping container 1 on top 6 of support 5.

From what has been described so far it will be seen that, in that they have different surface areas or thicknesses, the components or parts which are brought together for subsequent brazing are subject to serious problems of unacceptable local deformation in those parts which, although they do not have to be brazed, are nevertheless subjected to heat.

In order to solve this problem, device 12 has an air blower 14 whose action is to keep cool the central part of plate 3 which is remote from the brazing process, during the process so that the heating action does not take place in this central part, thus making it possible to protect

plate 3 from the effects of thermal deformation.

This integrity of plate 3 is particularly important in connection with subsequent use of the container whose base will be heated by resistance 2 in an absolutely uniform way.

Finally, it should be noted that the effect of cooling the central part of said plate 3 may be obtained not only by the action of blowing air, but also or alternatively by the action of extracting the heat developed during brazing by other means, without thereby going beyond the scope of the invention.

CLAIMS

1. Means for the brazing of components having different thicknesses and/or areas of contact comprising a first device (5) acting as a support for holding a first component (1), the said first device (5) having a top (6) including an induction heating coil (7), and a second device (12) for holding the components in position.

2. Brazing means as claimed in claim 1, in which the second device (12) has a plurality of rams (13) designed to hold components together, such as a second component (2) placed on a third component (3) (such as comprising the base of an electrically heatable container (1)), in position for brazing.

3. Brazing means as claimed in claim 1, in which said one side of device (5) includes a centering pin (8) on which are located three disks (9, 10 and 11) of mica, steel and graphite respectively placed on the top (6) of the support (5).

4. Brazing means as claimed in claim 2, in which the device (12) also has a spring-loaded ram (15) designed to act with on a component such as a plate (3) in the free area such as lying between the supply terminals of the resistance (2) in order to hold it in position.

5. Brazing means as claimed in any of claims 1 to 4, in which cooling means are provided to remove heat from at least one area of the workpiece not being brazed or only being subject to partial brazing.

6. Brazing means as claimed in claim 5, in which the cooling means are provided on the device (12) which has an air blower or heat extractor (14) intended to cool the central part of the plate (3) during the brazing operation.

7. Brazing means as claimed in any of claims 1 to 4, in which the components to be brazed together comprise a metal container (1) having a base, a base plate (3) and a resistance (2) for heating the metal container.

8. Means for brazing components together substantially any herein described with reference to the accompanying drawings.

Patent Office

7.

Application No: GB 9810717.0
Claims searched: 1-8

Examiner: Dave Butters
Date of search: 6 August 1998

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

UK Cl (Ed.P): B3R

Int Cl (Ed.6): B23K

Other: Online: WPI

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
X	EP 0244947 A (DE BEERS)(col 3 line 54 - col 4 line 15)	1,2,4,7
X	US 4224494 A (TOCCO-STEEL)(whole document)	1,2,4,7

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.